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PATENT
0965-0232P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: Toshio NISHI et al. Conf.: 9403
Serial No.: 09/118,833 Art Unit: 1745
Filed: July 20, 1998 Examiner: J. CREPEAU
For: SOLID ELECTROLYTE TYPE FUEL BATTERY

DECLARATION UNDER 37 C.F.R. §1.132

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

I, Toshio NISHI, do declare and say as follows:

1. I am one of the inventors of the U.S. Patent Application Serial No. 09/118,833, filed July 20, 1998, and I am familiar with the contents of the application, its prosecution before the U.S. Patent and Trademark Office, and the references cited therein. I am a citizen of Japan, residing at c/o Nagasaki Research & Development Center, Mitsubishi Heavy Industries, Ltd., 717-1, Fukahori-machi 5-chome, Nagasaki-shi, Nagasaki, Japan. I have been employed by Mitsubishi Heavy Industries, Ltd. for over 20 years, and have worked at the Research Laboratory of the Company.

2. I have studied the contents of U.S. Patent 5,411,767, hereinafter referred to as SOMA.

3. To show the superiority of the present invention, I am submitting the attached SEM photomicrographs of plasma sprayed material (A) and co-sintered material (B). The materials (A) and (B) being compared have the same chemical composition. In reference to these SEM photomicrographs (A) and (B), I am making the following observations:

When plasma spraying is applied as in SOMA and other conventional art processes, a number of air spaces are produced in the plasma-sprayed film having a thickness of from several to dozens of microns. This can be clearly observed in the dense-blue cored portion of SEM photomicrograph (A) (also note the micron bar for scale).

In contrast, when the inventive co-sintering is utilized, a film having a very dense structure is formed. This is clearly observable in SEM photomicrograph (B). Incidentally, the portions that appear to be air spaces in SEM photomicrograph (B) are produced during thermal etching. However, the sizes of these air spaces are very small, on the order of submicrons, as indicated by the micron bar for scale.

As a result, a "sintered" or "co-sintered" material such as an interconnector does not represent a process step. Instead, a "sintered" or "co-sintered" material represents a physical state of matter that is achieved through the sintering process. This state

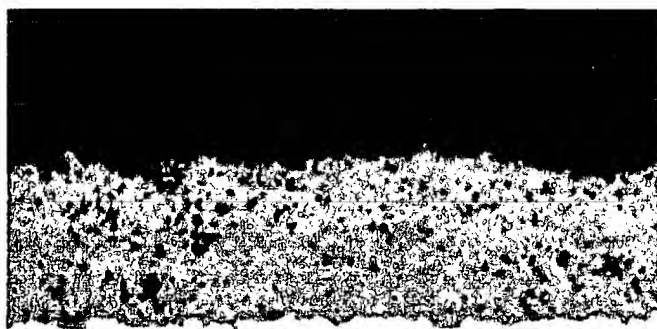
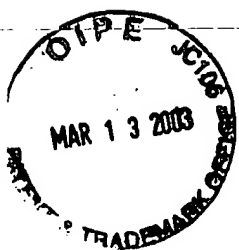
of matter is readily discernable by comparing SEM photomicrographs (A) and (B).

Therefore, the plasma sprayed film of SOMA is incapable of attaining the sintered or co-sintered interconnector of the invention. Therefore, SOMA fails to either teach or suggest a sintered or co-sintered interconnector of the invention. The high density achievable by the inventive technology and demonstrated in the attached SEM photomicrographs are a clear demonstration of unexpected results over SOMA.

4. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

January 27, 2003
Date

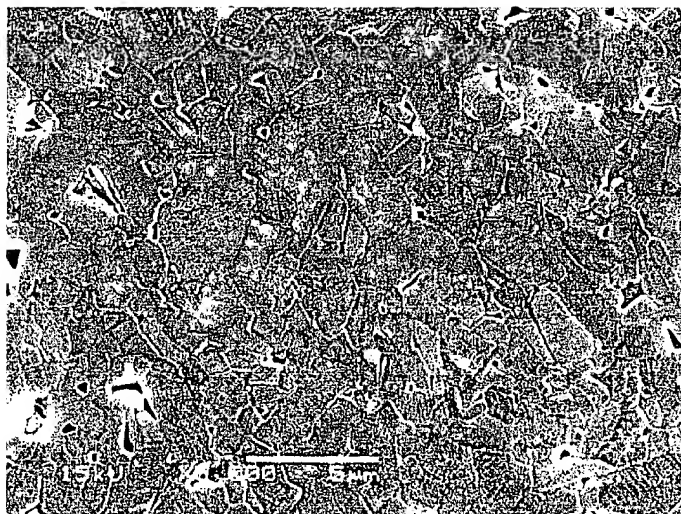
By Toshiro Nishi
Toshiro NISHI



Plasma-sprayed film

100 μ m

(A)



(B)